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            20                  25                  30

Cys Ala Asn Arg Glu Val Lys Phe Leu Ser Asn Leu Leu Ile Leu Phe
        35                  40                  45

Met Phe Gln Gln Lys Leu Ala Asn Val Leu Phe Ser Phe Cys Gln Val
    50                  55                  60

Val Ile Val Lys Lys Val Leu Asn Ser Ile Phe Arg Ser Leu Cys Leu
65                  70                  75                  80

Ser Leu Val Ser Phe Phe Gln Glu Arg Ile Ile Phe Lys Ile Ile Lys
                85                  90                  95

Lys Lys Pro Ala Gly Asn Asp Gly Lys Glu Ile Phe Asn Ile Ser Ile
            100                 105                 110

His Asn Phe Cys Ile Lys Asn Thr Val Leu Ile Asn Ser Glu Asn Asn
        115                 120                 125

Lys Ser Val Leu Asn Asn Ser Asn Thr Gly Asn His Ser Gln Ser Asp
    130                 135                 140

Phe Ile Phe Phe Thr Leu Ala Tyr Ile Phe Leu Leu Thr Ile Glu Lys
145                 150                 155                 160

Gly Tyr Gln Ala Cys Ile Lys Gln Lys Gln Leu Ile Trp Val Ile Glu
                165                 170                 175

Val Tyr Leu Cys Ser Cys Ile Gly Gln Trp Trp Glu His Lys Glu Lys
            180                 185                 190

Asn Ser Asp Glu Val Phe Pro Pro Arg His Phe Pro Phe Thr Ile Met
        195                 200                 205

Asn Asn Pro Leu Thr Lys Val Val Asn Glu Lys Asn Ser Cys Phe Asn
    210                 215                 220
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Glu Arg Ser Ser Leu Lys Gly Thr Val Val Ile Gly Ser Lys Thr Asn
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Asn Phe Ser His Asn Asn Arg Ile Ile Asp Lys Lys Glu Gln Ile Lys
245 250 255

Arg Ser Asp Val Lys Cys Leu Leu Phe Phe Ser Tyr Lys Glu Ala Tyr
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Arg Lys Gly His Gly Asn Gly Ile Lys His His Ile Ile Asp Ile Asp
275 280 285

Glu Phe Asn Phe His
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Val Asp Leu Ser Leu Lys Ile Lys Ala Cys Ile Lys Asn Gly Tyr Tyr
35 40 45

Pro Pro Leu Leu Glu His Lys Ser Leu Gly Met Ile Phe Gln Gln Thr
50 55 60

Ser Thr Arg Thr Arg Val Ser Phe Glu Thr Ala Met Ser Gln Leu Gly
65 70 75 80

Gly His Ala Gln Tyr Leu Ala Pro Gly Gln Ile Gln Leu Gly Gly His
85 90 95

Glu Thr Ile Glu Asp Thr Ser Thr Val Leu Ser Arg Leu Asp Asp Ile
100 105 110

Leu Met Ala Arg Val Glu Arg His Gln Ser Val Val Asp Leu Ala Arg
115 120 125

Cys Ala Ser Ile Pro Val Ile Asn Gly Met Ser Asp Tyr Asn His Pro
130 135 140

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Thr Gln Glu Leu Gly Asp Leu Cys Thr Met Ile Glu His Leu Pro Ala
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Gly Lys Lys Leu Glu Asp Cys Lys Val Val Phe Val Gly Asp Ala Thr
                165                 170                 175

Gln Val Cys Phe Ser Leu Ala Leu Ile Thr Thr Lys Met Gly Met Glu
            180                 185                 190

Phe Val His Phe Gly Pro Lys Gly Phe Gln Leu Asn Asp Met His Lys
        195                 200                 205

Glu Lys Leu Asp Lys Ile Cys Glu Arg Ser Gly Gly Lys Tyr Thr Val
    210                 215                 220

Thr Asp Asn Glu Asp Ala Ile Glu Gly Ala Asp Phe Leu Tyr Thr Asp
225                 230                 235                 240

Val Trp Tyr Gly Leu Tyr Glu Ala Glu Leu Ser Glu Glu Glu Arg Met
                245                 250                 255

Gln Ile Phe Phe Pro Lys Tyr Gln Val Asp Ser Gln Met Met Ala Lys
            260                 265                 270

Ala Gly Ala Asp Cys Lys Phe Met His Cys Leu Pro Ala Thr Arg Gly
        275                 280                 285

Glu Glu Ile Thr Asp Glu Val Met Asp Gly Pro His Ser Ile Cys Phe
    290                 295                 300

Asp Glu Ala Glu Asn Arg Leu Thr Ser Ile Arg Gly Leu Leu Val Tyr
305                 310                 315                 320

Leu Leu Arg Asp Tyr Arg Glu Lys Asn Pro Tyr Asp Leu Val Lys Gln
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Glu Lys Ala Lys Glu Glu Leu Glu Thr Phe Leu Lys Pro Glu
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<213> Streptococcus mutans

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            20                  25                  30

Gly Asn Ser Gln Phe Phe Trp Trp Leu Phe Leu Leu Ile Ala Phe Leu
        35                  40                  45

Leu Pro Tyr Gly Leu Ile Ser Ser Glu Leu Gly Thr Thr Tyr Ile Gly
    50                  55                  60

Asp Gly Gly Ile Tyr Asp Trp Val Thr Lys Ala Phe Gly His Lys Trp
65                  70                  75                  80

Gly Ser Arg Val Ala Trp Tyr Tyr Trp Ile Asn Phe Pro Leu Trp Leu
                85                  90                  95

Ala Ser Leu Ala Val Met Thr Pro Gly Leu Leu Thr Thr Val Thr Gly
            100                 105                 110

His Asn Phe Ser Thr Val Thr Ala Ile Ile Val Glu Leu Ile Phe Ile
        115                 120                 125

Trp Leu Val Ile Trp Ile Ser Phe Tyr Pro Val Ser Asp Ser Ile Trp
    130                 135                 140

Ile Leu Asn Gly Ala Ala Val Ile Lys Met Leu Leu Ala Leu Leu Val
145                 150                 155                 160

Gly Gly Leu Gly Leu Tyr Val Ala Leu Thr Lys Gly Met Ala Asn Glu
                165                 170                 175

Met Thr Leu Lys Ser Leu Leu Pro Ser Phe Asn Leu Asn Ser Leu Ser
            180                 185                 190

Tyr Ile Ser Val Ile Ile Phe Asn Leu Leu Gly Phe Glu Val Ile Cys
        195                 200                 205

Thr Phe Ala Gly Asp Met Glu Asn Pro Lys Lys Gln Ile Pro Gln Ser
    210                 215                 220

Ile Ile Val Ala Gly Leu Val Ile Ala Ala Ile Tyr Ile Phe Ser Ala
225                 230                 235                 240

Phe Gly Ile Gly Val Ser Ile Pro Thr Asp Lys Ile Ser Thr Ser Ser
                245                 250                 255

Gly Met Met Asp Ser Phe Lys Leu Leu Thr Gly Ser Thr Gly Gly Trp
            260                 265                 270
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Phe Ile Met Thr Met Ala Phe Leu Phe Leu Leu Thr Leu Phe Gly Asn
        275                 280                 285

Met Ile Ser Trp Ser Leu Gly Val Asn Asn Thr Ala Ser Tyr Ala Ala
    290                 295                 300

Glu Asn Gly Asp Met Pro Gln Phe Phe Ala Lys Arg Ser Arg Lys Arg
305                 310                 315                 320

Asp Met Pro Ile Gly Ala Ala Leu Ala Asn Gly Ile Val Ala Ser Ile
                325                 330                 335

Val Val Val Ile Ala Pro Phe Leu Pro Asn Gln Asp Leu Phe Trp Ala
            340                 345                 350

Phe Phe Ser Leu Asn Leu Val Met Phe Leu Leu Ser Tyr Val Pro Val
        355                 360                 365

Phe Pro Ala Phe Phe Lys Leu Arg Lys Ile Asp Pro Asp Thr Pro Arg
    370                 375                 380

Pro Phe Lys Val Ser Gly Asn Asp Ser Phe Leu Arg Leu Leu Val Ile
385                 390                 395                 400

Leu Pro Met Ile Leu Ile Ile Ile Ser Leu Ile Phe Thr Ala Leu Pro
                405                 410                 415

Leu Ala Phe Asp Ser Glu Thr Leu Ala Ser Lys Leu Pro Ile Thr Ile
            420                 425                 430

Gly Ser Leu Ile Phe Ile Gly Ile Gly Glu Leu Ile Ile Ile Ile Lys
        435                 440                 445

Lys Ile Lys Lys
    450
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<210> 49
<211> 369
<212> PRT
<213> Streptococcus mutans

<400> 49

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Met Ala Lys Arg Ile Lys Asn Thr Thr Pro Lys Gln Asp Gly Phe Arg
1               5                   10                  15

Met Pro Gly Glu Phe Glu Lys Gln Lys Gln Ile Trp Met Leu Trp Pro
            20                  25                  30
```

```
Trp Arg Asn Asp Asn Trp Arg Leu Gly Ala Lys Pro Ala Gln Lys Ala
        35                  40                  45

Phe Leu Glu Val Ala Glu Ala Ile Ser Glu Phe Glu Pro Val Ser Leu
    50                  55                  60

Cys Val Pro Pro Leu Gln Tyr Glu Asn Ala Leu Ala Arg Val Ser Glu
65                  70                  75                  80

Leu Gly Ser His Asn Ile Arg Ile Ile Glu Met Thr Asn Asp Asp Ala
                85                  90                  95

Trp Ile Arg Asp Cys Gly Pro Thr Phe Leu Val Asn Asp Lys Gly Asp
            100                 105                 110

Leu Arg Ala Val Asp Trp Glu Phe Asn Ala Trp Gly Gly Leu Val Asp
        115                 120                 125

Gly Leu Tyr Phe Pro Trp Asp Gln Asp Ala Leu Val Ala Arg Lys Val
    130                 135                 140

Cys Glu Ile Glu Gly Val Asp Ser Tyr Lys Thr Lys Asp Phe Val Leu
145                 150                 155                 160

Glu Gly Gly Ser Ile His Val Asp Gly Glu Gly Thr Val Leu Val Thr
                165                 170                 175

Glu Met Cys Leu Leu His Pro Ser Arg Asn Pro His Leu Thr Lys Glu
            180                 185                 190

Asp Ile Glu Asp Lys Leu Lys Asp Tyr Leu Asn Cys Val Lys Val Leu
        195                 200                 205

Trp Val Lys Asp Gly Ile Asp Pro Tyr Glu Thr Asn Gly His Ile Asp
    210                 215                 220

Asp Val Ala Cys Phe Ile Arg Pro Gly Glu Val Ala Cys Ile Tyr Thr
225                 230                 235                 240

Asp Asp Lys Glu His Pro Phe Tyr Gln Glu Ala Lys Ala Ala Tyr Asp
                245                 250                 255

Phe Leu Ser Gln Gln Thr Asp Ala Lys Gly Arg Pro Leu Lys Val His
            260                 265                 270

Lys Met Cys Val Thr Lys Glu Pro Cys Tyr Leu Gln Glu Ala Ala Thr
        275                 280                 285
```

Ile Asp Tyr Val Glu Gly Ser Ile Pro Arg Glu Glu Gly Glu Met Ala
290 295 300

Ile Ala Ser Tyr Leu Asn Phe Leu Ile Val Asn Gly Gly Ile Ile Leu
305 310 315 320

Pro Gln Tyr Gly Asp Glu Asn Asp Gln Leu Ala Lys Gln Gln Val Gln
325 330 335

Glu Met Phe Pro Asp Arg Lys Val Val Gly Val Arg Thr Glu Glu Ile
340 345 350

Ala Tyr Gly Gly Gly Asn Ile His Cys Ile Thr Gln Gln Gln Pro Ala
355 360 365

Thr

<210> 50
<211> 316
<212> PRT
<213> Streptococcus mutans

<400> 50

Met Ala Lys Arg Lys Ile Val Ile Ala Leu Gly Gly Asn Ala Ile Leu
1 5 10 15

Ser Arg Asp Ala Ser Ala Lys Ala Gln Gln Ala Ala Leu Ala Gln Thr
20 25 30

Ala Lys Tyr Leu Val Gln Phe Ile Lys Asn Gly Asp Asp Leu Val Ile
35 40 45

Thr His Gly Asn Gly Pro Gln Val Gly Asn Leu Leu Leu Gln Gln Thr
50 55 60

Ala Ala Asp Ser Tyr Asp Asn Pro Ala Leu Pro Leu Asp Thr Leu Val
65 70 75 80

Ala Met Thr Glu Gly Ser Ile Ser Tyr Trp Leu Gln Asn Ala Leu Ile
85 90 95

Asn Glu Leu Arg Lys Gln Ser Ile Asp Lys Glu Val Val Ser Met Val
100 105 110

Thr Glu Val Leu Val Ser Ala Glu Asp Pro Ala Phe Asp His Pro Ser
115 120 125

```
Lys Pro Ile Gly Pro Phe Leu Ser Glu Glu Glu Ala Tyr Leu Gln Glu
    130                 135                 140

Lys Met Thr Gly Ala Thr Tyr Lys Val Asp Ala Gly Arg Gly Trp Arg
145                 150                 155                 160

Lys Val Val Ala Ser Pro Lys Pro Ile Ala Ile Gln Glu Ile Ala Thr
                165                 170                 175

Ile Lys Ser Leu Leu Asn Thr Gly Ala Val Val Ile Thr Ala Gly Gly
            180                 185                 190

Gly Gly Ile Pro Val Ile Glu Asp Pro Lys Thr Lys Glu Leu Met Gly
        195                 200                 205

Val Glu Ala Val Ile Asp Lys Asp Phe Ala Ser Gln Leu Leu Ala Glu
    210                 215                 220

Lys Ile Lys Ala Asp Leu Phe Ile Ile Leu Thr Gly Val Asp His Val
225                 230                 235                 240

Tyr Ile His Tyr Gly Gln Pro Asn Gln Glu Lys Leu Glu Lys Val Thr
                245                 250                 255

Ala Ser Gln Leu Lys Ala Trp Lys Asp Gln Gln Gln Phe Ala Ala Gly
            260                 265                 270

Ser Met Leu Pro Lys Val Glu Ala Ala Ile Ala Phe Val Glu Ala His
        275                 280                 285

Pro Ser Gly Lys Ala Ile Ile Thr Ser Leu Glu Asn Ile Ala Asn Val
    290                 295                 300

Ile Ser Glu Gly Ser Gly Thr Gln Ile Thr Ala Asn
305                 310                 315
```